

WHAT IS CLAIMED IS:

1. An apparatus for taking an image of a subject comprising:

mode setting means for setting either of first and  
5 second modes;

an interline transfer imaging device having  
photosensitive sections each of which is composed of a  
plurality of pixels arranged in the vertical direction  
and responsive to incident light for producing charges,  
10 vertical transfer paths arranged alternately with the  
photosensitive sections in the horizontal direction,  
each of the vertical transfer paths being arranged to  
vertically transfer signal charges produced from a  
corresponding one of the photosensitive sections, and a  
15 horizontal transfer path for transferring signal  
charges transferred by the vertical transfer paths to  
outside of the imaging device;

driving means for driving the imaging device,  
which, in the first mode, produces first vertical drive  
20 signals that cause signal charges produced in each of  
the photosensitive sections to be transferred from a  
corresponding one of the vertical transfer paths to the  
horizontal transfer path at a first normal transfer  
rate, in the second mode, produces second vertical  
25 drive signals that cause signal charges produced in  
each of the photosensitive sections to be transferred  
from a corresponding one of the vertical transfer paths

to the horizontal transfer path at a second transfer rate N times the first normal transfer rate so that pixel signals from each of the vertical transfer paths are added together in the horizontal transfer path, and, in each of the first and second modes, produces horizontal transfer signals that cause signal charges in the horizontal transfer path to be transferred to outside of the imaging device as a line of image signal; and

processing means for processing the image signal read out of the horizontal transfer path, the processing means, in the first mode, performing processing on the image signal output from the horizontal transfer path for conversion into image data, and, in the second mode, subjecting pixel signals in image signal from the horizontal transfer path which correspond to pixels arranged in the horizontal direction to addition and averaging and processing the resulting image signal for conversion into image data.

2. The apparatus according to claim 1, wherein the number of pixel signals is added together in the second mode by the drive means, the same number of pixel signals is added together in the second mode by the processing means, and the number is an integer N of not less than two.

3. The apparatus according to claim 2, further comprising exposure control means for controlling the

amount of light falling on the imaging device, the exposure control means setting the target exposure value in the second mode to  $1/N$  the target value in the first mode.

5           4. The apparatus according to claim 2, wherein in the second mode the driving means drives the vertical transfer paths in the imaging device at twice the rate in the first mode so that signal charges from two  
10           the photosensitive sections are added together in the horizontal transfer path.

          5. The apparatus according to claim 2, wherein, in the second mode, the output of the addition  
15           operation means is substantially decreased in a level by a factor of  $N$  and then subjected to the same signal processing as in the first mode.

          6. The apparatus according to claim 1, further comprising exposure control means for controlling the amount of light falling on the imaging device, and  
20           wherein the number of pixel signals to be added together in the second mode by the drive means is an integer  $N$  of not less than two and the exposure control means sets the target exposure value in the second mode to a predetermined value less than  $1/N$  the target  
25           exposure value in the first mode.

          7. An apparatus for taking an image of a subject comprising:

mode setting means for setting either of first and second modes;

an interline transfer imaging device having photosensitive sections each of which is composed of a plurality of pixels arranged in the vertical direction and responsive to incident light for producing charges, vertical transfer paths arranged alternately with the photosensitive sections in the horizontal direction, each of the vertical transfer paths being arranged to vertically transfer signal charges produced in a corresponding one of the photosensitive sections, a horizontal transfer path for transferring signal charges transferred by the vertical transfer paths to outside of the imaging device, and Bayer-arranged color filter elements each of which is aligned with a corresponding one of the pixels of the photosensitive sections;

driving means for driving the imaging device, which, in the first mode, produces first vertical drive signals that cause signal charges produced in each of the photosensitive sections to be transferred from the vertical transfer paths to the horizontal transfer path at a first normal transfer rate, in the second mode, produces second vertical drive signals that cause signal charges produced in each of the photosensitive sections to be transferred from the vertical transfer paths to the horizontal transfer path at a second

transfer rate N times the first normal transfer rate so that pixel signals from pixels corresponding to color filter elements of the same color in each of the photosensitive sections are added together in the horizontal transfer path, and, in each of the first and second modes, produces horizontal transfer signals that cause signal charges in the horizontal transfer path to be transferred to outside of the imaging device as a line of image signal; and

processing means for processing pixel signals read out of the horizontal transfer path, the processing means, in the first mode, performing processing on the image signal output from the horizontal transfer path for conversion into image data, and, in the second mode, subjecting pixel signals from the horizontal transfer path which are produced from pixels corresponding to color filter elements of the same color and arranged in the horizontal direction to addition and averaging and processing the resulting image signal for conversion into image data.

8. The apparatus according to claim 7, wherein in the second mode the processing means performs addition on alternate pixel signals in one line of pixel signals.

9. The apparatus according to claim 7, wherein the number of pixel signals is added together in the second mode by the drive means, the same number of pixel signals is added together in the second mode by

the processing means, and the number is an integer N of not less than two.

10. The apparatus according to claim 9, further comprising exposure control means for controlling the amount of light falling on the imaging device, the exposure control means setting the target exposure value in the second mode to  $1/N$  the target value in the first mode.

11. The apparatus according to claim 9, wherein in the second mode the driving means drives the vertical transfer paths in the imaging device at twice the rate in the first mode so that signal charges from two pixels arranged in the vertical direction in each of the photosensitive sections are added together in the horizontal transfer path.

12. The apparatus according to claim 9, wherein, in the second mode, the output of the addition operation means is substantially decreased in a level by a factor of N and then subjected to the same signal processing as in the first mode.

13. The apparatus according to claim 9, further comprising exposure control means for controlling the amount of light falling on the imaging device, and wherein the number of pixel signals to be added together in the second mode by the drive means is an integer N of not less than two and the exposure control means sets the target exposure value in the second mode

to a predetermined value less than  $1/N$  the target exposure value in the first mode.

14. An electronic imaging apparatus capable of adding pixel signal and outputting the added pixel signal, comprising:

a solid state imaging device including matrix array of pixels for generating the pixel signals, which is provided with color filters of the Bayer arrangement, the pixel signals being selectively output at a normal transfer rate or at  $N$  time the normal transfer rate, wherein the  $N$  is not smaller than 2 and is integer;

image processing circuit including A/D converter for converting the pixel signal to digital signals and digital processor for processing the digital signal;

controlling means for controlling said solid state imaging device as to add the pixel signal from some of the pixels of the same color which are relatively closed and arranged along the row of the matrix array and said image processing circuit to add the pixel signal from some of the pixels of the same color which are relatively closed and arranged along the column of the matrix array.

15. The apparatus according to claim 14, wherein said solid state imaging device is interlace read out type.

16. The apparatus according to claim 14, wherein

said solid state imaging device is interline charge transfer type.